SEAMAP
A MIND Technology Business

SEAMAP GUNLINK™ 4000

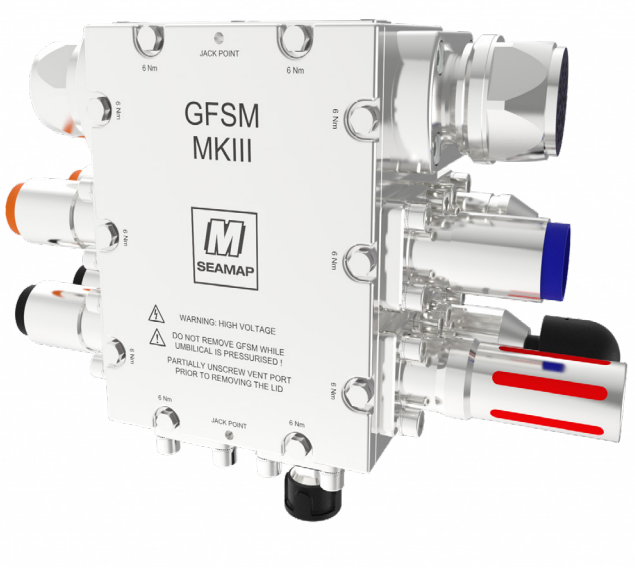
FULLY DISTRIBUTED IN-WATER SOURCE CONTROLLER AND HYDROPHONE DATA ACQUISITION SYSTEM

The GunLink 4000 is the third phase of Seamap's range of new generation hydrophone monitoring and source control systems.

The system provides in-water firing control and sensor timing monitoring of up to 256 standard guns (128 GI guns) and is capable of receiving hydrophone data from up to 256 near field phones. The GunLink 4000 moves the system electronics in to the water allowing it to be mounted close to the gun array, thus reducing umbilical diameters, increasing umbilical lengths and allowing shorter offsets.

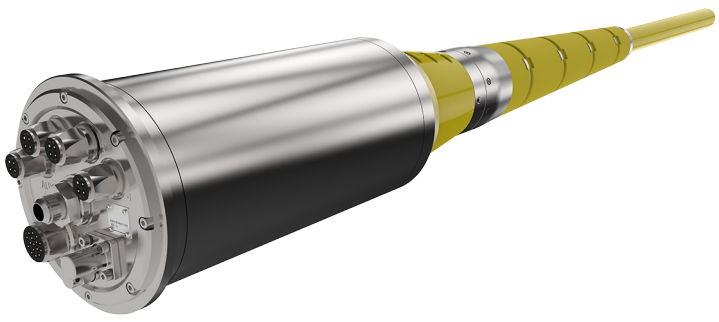
The GunLink 4000 comprises of a Host Computer and Timing Control Unit (TCU), an Umbilical Termination Module (UTM) for each umbilical and a Gun Firing & Sensing Module (GFSM) for each one or two gun cluster. The GFSM also incorporates a depth sensor, a pressure sensor and a connector for an external hydrophone. Seamap Calibrated Hydrophones are fully supported. The GFSM's are daisy chained along the array starting from the UTM with only a single cable between each module thus reducing the complexity of the array wiring.

Individual gun fire times and solenoid coil current logging enables the firing pulse to be fed to each gun solenoid at the calculated time for a programmable period and voltage. The in-water circuitry allows each near field phone and firing sensor to be monitored continuously using a 24 bit A/D converter sampling at 0.1mS thus providing increased gun firing accuracy and auto-fire detection. The Host Computer runs the main operating and control software under the LINUX operating system and provides the main system control and display functions. The software has been designed to be both intuitive and simple to use, providing the operator with real time data and easily recognizable indications of deteriorating gun performance.



Gun Firing & Sensing Module (GFSM)

- Gun Capacity: Firing and Sensor Circuits for up to 256 guns (128 GI Guns).
- Near Field Phone Monitoring: Up to 256 near field phone 24 bit inputs sampled continuously at 0.1mS.
- Depth and High Pressure Inputs: Each Gun Firing Sensing Module is fitted with a depth and a high pressure air sensor.
- User Interface: Twin screen Graphical User Interface.
- Slipring – Electrical with high speed Ethernet or Optical version as options
- MOB Interface: Direct interface to vessel's Seamap MOB system.
- Air System: To simplify the air distribution at the cluster.
- FiberLink Media Converters – option for winch mounted (for electrical slip rings) or instrumentation room (for optical slip rings).
- Umbilical Termination: Provides power connections for additional in water auxiliary equipment such as the BuoyLink EX GPS.



Umbilical Termination Module (UTM)

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Specifications:

General System Features	
Total Number of Guns	256 (128 GI Guns)
Monitored Variables	• Gun Fire Time • Near field hydrophone signals (one per GFSM) • Depth Sensor and air line pressure (one of each per GFSM) • Solenoid coil current
Controlled Variables	• Gun fire time • Gun firing pulse length and voltage
Ancillary Monitored Variables	• Atmospheric Pressure • Up to 23 compressor and umbilical line pressure inputs
Remote Displays	Large format digital pressure displays to display umbilical pressures on the gun deck.
Supported Guns	• Bolt 1500 and 1900 series Guns • Seamap Sleeve Guns • Sercel G and GI Guns
Safety Features	• Key controlled remote and local system disable • Bleed resistors on each solenoid output dump charge at system disable • Interface to vessel's MOB system

System Performance	
Timing Resolution	0.1 mS
Fire Detect Window	Up to 1024 mS
Synchronization Modes	Automatic (Additional algorithms available as required)
Fire Detect Method	Sensor or Hydrophone selectable
Fire Time Pick Method	Zero crossing, level detect, peak detect or combinations of all three
Data Time Stamping	All date time stamped to GPS time

Software	
Graphical at-a-glance status screen	Continuous update for each gun to indicate Gun fire; errors (faults); auto fire; double pop; depth; pressures and timing performance for each gun
Text Based Status in Tabular Format For Each Gun	Physical addressing; volume; timing error value; gun fire delay value; aim point offset value; depth value; array assignment; operational status and fault indication

Installation	
Input Power	110 to 240 Volt AC, 50/60 Hz
Instrumentation Room	19" Rack Mount, typical installation 38U
Gun Deck	Deckleads (up to 95m), Winch Reel Interface Module (WRIM), Sliprings
Gun String	Umbilical termination, TEM, GFSMs (all sizes on request)

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